Article

Mapping of Astronomy and Astrophysics Publications: A Scientometric Study

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Abstract

This paper discusses about the Astronomy and Astrophysics publications and its citation available in the Scimago Journal and Country Rank data base by the authors from top 15 countries (based on publications). The relevant data are collected from Scimago Journal and Country Rank data base and it was analyzed. It shows among the Astronomy and Astrophysics publications totally 379440 articles were published maximum of 105940 (27.92%) articles published by United States and followed by Germany with 41152 (10.85%) publications during the study period.

Keywords: Astronomy, Astrophysics, Scientometric, Scimago Journal and Country Rank, Citations, Citable Documents, Self Citations, H-Index

Introduction

The true barometer of assessing the quality and quantity of a journal is the Citation Index. While discussing citation, one needs to understand the citation. Simply, when another refers other works in his/her article, we call the article referred is cited. In other words the citation is called as the previous work which is referred in the present work. The quality of a given work can rightly be adjudged through the number of citations that it gets. Therefore, a certain piece of article or research paper is carrying more number of citations get more impact than the work carrying less citation. Therefore, we always refer to some indexing and abstracting databases like Scopus, Web of Science, or even Google Scholars to know the impact of a journal, a particular article or a particular author. Scimago Journal and Country Rank database developed by Scimago Lab and powered by Scopus

Review of literature

Nicholas and Ritchie (1978) [1] view that, "study of bibliometrics concept provides information, knowledge and how it is communicated". Moreover, bibliometric studies are normally employed to evaluate the academic research output, the quality of the journal, impact and influence of articles, authors, and assorted parameters. Though there has been substantial growth of literature on bibliometric studies during the last decade, the authors focus on some of the pertinent literature that relate to the present study.

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Potter (1981) [2] defines bibliometric analysis as "the calculation and study of the research publication patterns of all types of written communication and their authorship nature". In a most interesting study Mooghali ,et al. (2011)[3] analyzed records of three premiere indexes known as , "SSCI", "SCI", and "AHCI", and it is projected in the field of "scientometrics" evolved between 1980 to 2009. The pattern of growth of literature in the field of Nanoscience during 1990 to 2009 was reported by Karpagam et al. (2011)[4] .In the similar vein, Abramo (2011)[5] exercised bibliometric techniques on some national level research assessment. Lapon-Kandeishein and Prebor (2011) [6] bibliographical research on Hebrew printing also needs mention. In the similar light bibliometric studies by veterans like Krampen, Eye and Schui (2011) [7] , Kumar Suchetan (2012)[8] and others also presented findings on different directions. Dhanavandan and Tamizhchelvan (2014)[9] studied citations and research productivity of south Tamil Nadu universities from 2009 to 2013 based on Indian Citation Index (ICI)

Methodology

This study aims to discuss about the Astronomy and Astrophysics publications and its citation available in the Scimago Journal and Country Rank data base [10] by the top 15 countries (based on publications). The relevant data are collected from Scimago Journal and Country Rank database. Based on the available sources, the following discussions are made.

Analysis and interpretation

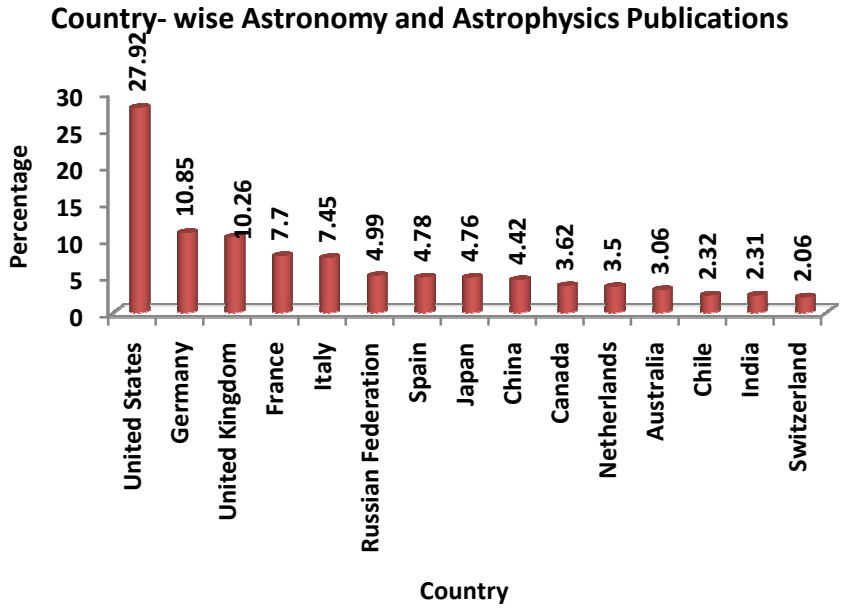
The distributions of the Astronomy and Astrophysics publications by the top 15 countries that is available in Scimago Journal and Country Rank data base which were analyzed in the table 1.

Country-wise astronomy and astrophysics publications (top 15 countries)

Table 1.Country-Wise Astronomy and Astrophysics Publications (Top 15 Countries)

S.NO	Country	Astronomy and Astrophysics Publication	%
1	United States	105940	27.92
2	Germany	41152	10.85
3	United Kingdom	38931	10.26
4	France	29220	7.70
5	Italy	28276	7.45
6	Russian Federation	18954	4.99
7	Spain	18135	4.78
8	Japan	18060	4.76
9	China	16756	4.42
10	Canada	13721	3.62
11	Netherlands	13272	3.50
12	Australia	11609	3.06
13	Chile	8807	2.32
14	India	8757	2.31
15	Switzerland	7850	2.06
	Total	379440	100

The above Table shows that the country-wise distribution of Astronomy and Astrophysics publications from top 15 countries. From 1996 to 2015, totally 379440 articles were published which are indexed in scimago database. Among the publications, maximum of 105940 (27.92%) articles published by United States and followed by Germany with 41152 (10.85%) publications.

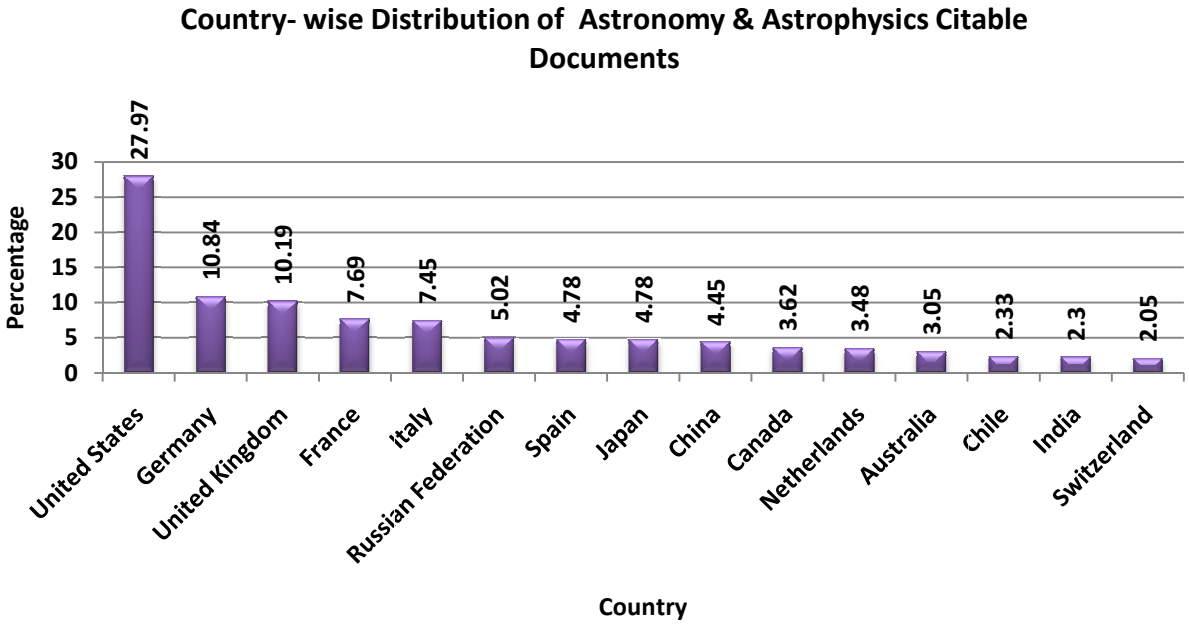


Country-wise distribution of astronomy and astrophysics citable documents

Table 2.Country-wise Distribution of Astronomy and Astrophysics Citable Documents

S.NO	Country	Astronomy & Astrophysics Citable Documents	%
1	United States	104425	27.97
2	Germany	40506	10.84
3	United Kingdom	38053	10.19
4	France	28706	7.69
5	Italy	27798	7.45
6	Russian Federation	18727	5.02
7	Spain	17830	4.78
8	Japan	17836	4.78
9	China	16603	4.45
10	Canada	13510	3.62
11	Netherlands	13008	3.48
12	Australia	11376	3.05
13	Chile	8690	2.33
14	India	8601	2.30
15	Switzerland	7675	2.05
	Total	373344	100

The above Table presents the country-wise distribution of Astronomy and Astrophysics citable documents (includes articles, reviews and conferences papers), from top 15 countries from 1996 to 2015, 373344 citable documents were available which are indexed in Scimago database. Among the citable documents maximum of 104425 (27.97%) by United States followed by Germany with 40506 (10.84%) and India contributed 8601 (2.30%) citable documents.

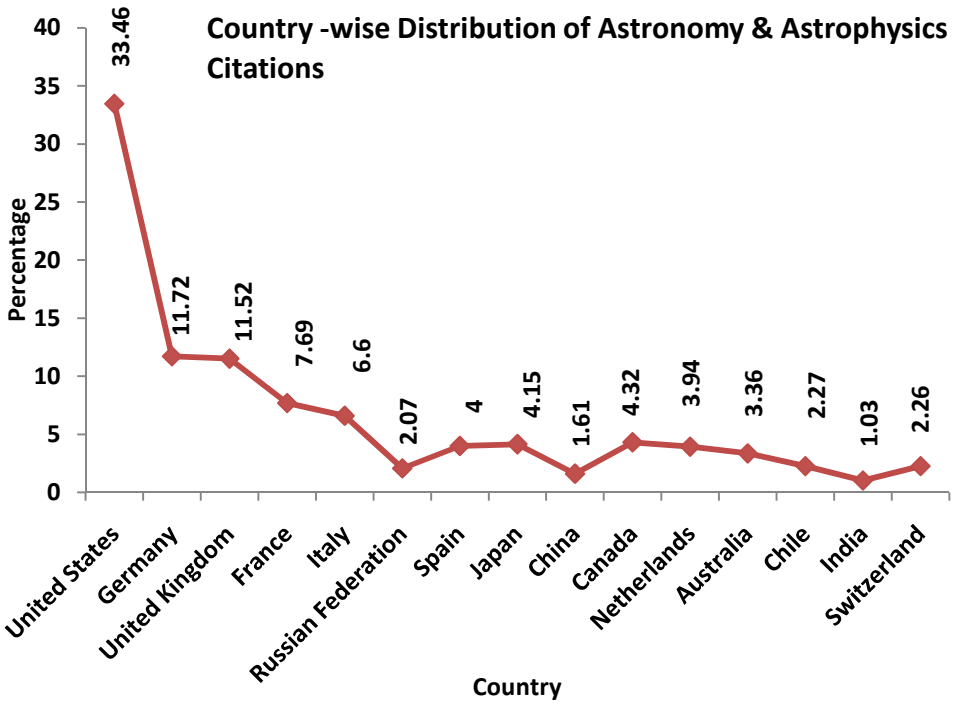


Country-wise distribution of astronomy and astrophysics citations:

Table 3.Country-wise Distribution of Astronomy and Astrophysics Citations

S. NO	Country	Astronomy and Astrophysics Citations	%
1	United States	3219442	33.46
2	Germany	1127205	11.72
3	United Kingdom	1108658	11.52
4	France	739760	7.69
5	Italy	634961	6.60
6	Russian Federation	199412	2.07
7	Spain	384638	4.00
8	Japan	399238	4.15
9	China	155151	1.61
10	Canada	415375	4.32
11	Netherlands	379029	3.94
12	Australia	323645	3.36
13	Chile	218737	2.27
14	India	99462	1.03
15	Switzerland	216987	2.26
	Total	9621700	100

The above Table presents the country -wise distribution of Astronomy and Astrophysics citations, from top 15 countries from 1996 to 2015**.** Among the citations maximum of 3219442 (33.46%) by United States followed by Germany with 1127205 (11.72%) but India's citation is only 99462 (1.03%).

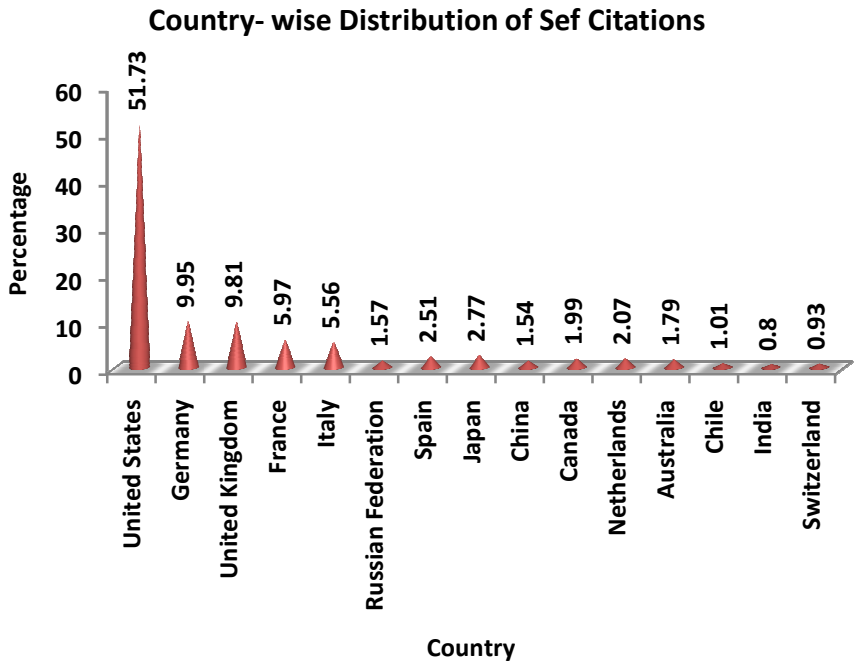


Country-wise distribution of self citations

Table 4.Country-wise Distribution of Sef Citations

S. NO	Country	Astronomy and Astrophysics Self Citations	%
1	United States	1941983	51.73
2	Germany	373477	9.95
3	United Kingdom	368306	9.81
4	France	224126	5.97
5	Italy	208670	5.56
6	Russian Federation	59026	1.57
7	Spain	94060	2.51
8	Japan	104091	2.77
9	China	57597	1.54
10	Canada	74524	1.99
11	Netherlands	77773	2.07
12	Australia	67379	1.79
13	Chile	38057	1.01
14	India	30183	0.80
15	Switzerland	34820	0.93
	Total	3754072	100

The above Table reveals that the country -wise distribution of Astronomy and Astrophysics self citations, from top 15 countries from 1996 to 2015. Among the Astronomy and Astrophysics self citations maximum of 1941983 (51.73%) by United States followed by Germany with 373477 (9.95%) and India's self citation is 30183 (0.80%).



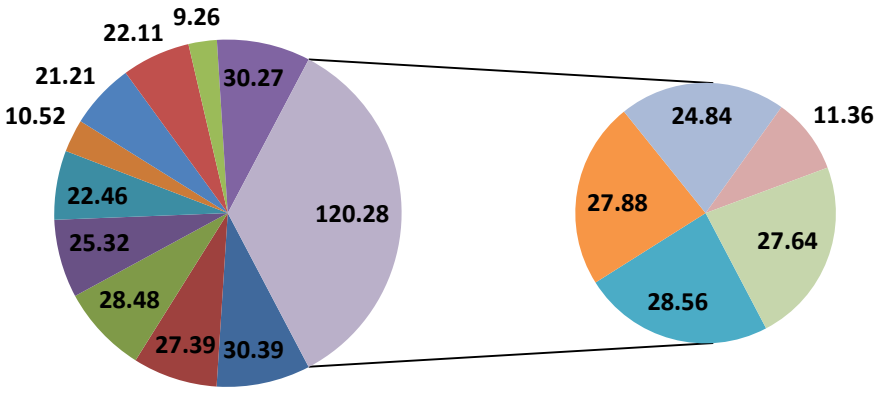
Ranking of country-wise citations per document

Table 5.Ranking of Country -wise Citations Per Document

S. NO	Country	Citations Per Document	Ranking
1	United States	30.39	I
2	Germany	27.39	VII
3	United Kingdom	28.48	IV
4	France	25.32	VIII
5	Italy	22.46	X
6	Russian Federation	10.52	XIV
7	Spain	21.21	XII
8	Japan	22.11	XI
9	China	9.26	XV
10	Canada	30.27	II
11	Netherlands	28.56	III
12	Australia	27.88	V
13	Chile	24.84	IX
14	India	11.36	XIII
15	Switzerland	27.64	VI

The above Table depicts that the ranking of country-wise distribution of citations per document (Average citations to documents published during 1996-2015), from top 15 countries**.** Among the citations per document study **United States** in first rank with 30.39 ,Canada with 30.27 in second rank and Netherlands is in third rank with 28.56 citations per document used.

Ranking of Country -wise Citations Per Document



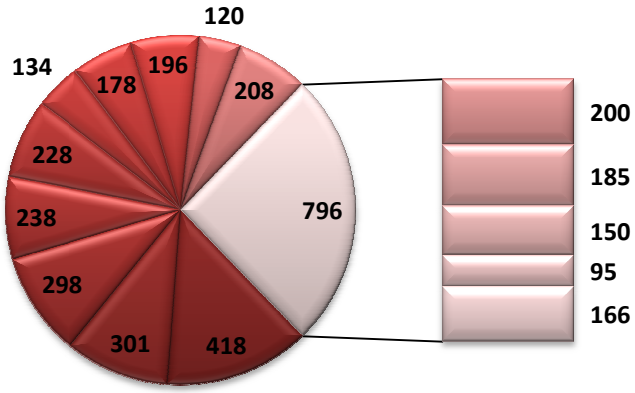
Ranking country-wise distribution of h index

Table 6.Ranking Country-wise Distribution of H Index

S. NO	Country	H Index	Ranking
1	United States	418	I
2	Germany	301	II
3	United Kingdom	298	III
4	France	238	IV
5	Italy	228	V
6	Russian Federation	134	XIII
7	Spain	178	X
8	Japan	196	VIII
9	China	120	XIV
10	Canada	208	VI
11	Netherlands	200	VII
12	Australia	185	IX
13	Chile	150	XII
14	India	95	XV
15	Switzerland	166	XI

The data presented in the above table shows that the ranking of country-wise distribution of H Index (country's number of articles (h) that have received at least h citations) the United States is in the first rank with 418 H indexes followed by Germany with 301 H indexes and United Kingdom is in third rank with 298 H indexes.

Ranking Country- wise Distribution of H Index



Conclusion

The quality and quantity of research are made available through indexing journals with citations of various articles. There is lacking, for providing citations to other articles which authors cite. For reviewing the previous articles which are very much important for supporting your article value added point for publishing. It is a good practice to give self citation for their previous works and it follows up of the previous one and improved one. During the study period from 1996 to 2015, totally 379440 articles were published maximum of 105940 (27.92%) articles published by United States followed by Germany with 41152 (10.85%) publications.

The present study proves that the maximum number of citable documents 104425 (27.97%) are from United States followed by Germany with 40506 (10.84%) and India contributed 8601 (2.30%) citable documents .The study reveals that maximum number of citations 3219442 (33.46%) by United States followed by Germany with 1127205 (11.72%) but India's citation is only 99462 (1.03%). The above study shows that the maximum number of self citations 1941983 (51.73%) from United States followed by Germany with 373477 (9.95%) and India's self citation is 30183 (0.80%). Among the citations per document study, United States is in first rank with 30.39, Canada with 30.27 in second rank and Netherlands is in third rank with 28.56 citations per document used. The H Index study shows that United States is in the first rank with 418 H indexes followed by Germany with 301 H indexes and United Kingdom is in third rank with 298 H indexes.It is concluded that the maximum number of Astronomy and Astrophysics publication, citations, self citations ,Citable documents, citations per document, and H index are from United States.

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